

NAVY PROGRAMS

Navy Extremely High Frequency Satellite Communications Program (NESP)

The Navy Extremely High Frequency (EHF) Satellite Communications Program (NESP) terminal connects ship, shore, and submarine platforms to the Military Strategic, Tactical, and Relay (MILSTAR) satellite constellation. The NESP terminal supports survivable, endurable, and flexible worldwide command and control communications to strategic and tactical Naval forces through all levels of conflict. The NESP terminal provides minimum essential secure communications in stressed environments that require anti-jam and low probability of intercept capabilities.

There are three different configurations of the NESP terminal corresponding to surface ship, shore, and submarine platforms. Although each terminal has the same basic capabilities, their antennas and other peripheral equipment vary by platform. The NESP terminal upgrades added a tactical medium data rate (MDR) capability to the existing strategic low data rate (LDR) capability. A limited number (64) of the existing NESP ship and shore terminals were upgraded with an MDR appliqué to achieve the combined low/medium data rate MILSTAR capability. All existing NESP terminals will be replaced with the follow-on terminal (FOT), which provides the same functionality as the MDR appliqué, but offers technology upgrades in terminal hardware and software. The submarine LDR terminals are also undergoing MDR upgrades, including installation of a new mast with a 16 inch antenna, as well as addition of super high frequency and Global Broadcast Service capabilities.

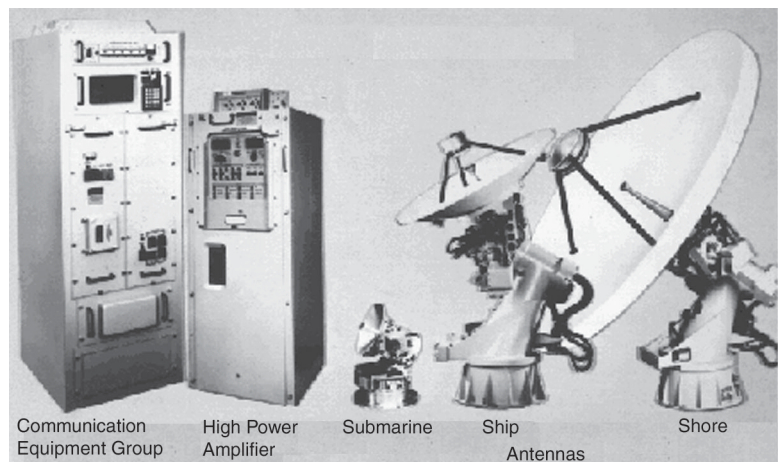
The Navy is developing two new communications controllers, the Navy EHF Communications Controller (NECC) and the Time Division Multiple Access Interface Processor (TIP). The NECC and TIP are baseband interface units that allow more efficient use of MILSTAR satellite resources. The NECC supports LDR data networks, while the TIP supports MDR data networks.

TEST & EVALUATION ACTIVITY

An approved Test and Evaluation Master Plan provides the bases for testing LDR, MDR, FOT, and the NECC and TIP controllers. DOT&E also approved the Operational Test IIIC (OT IIIC) test plan in March 2003. Testing of the NESP MDR terminal began with developmental test/operational test (DT/OT) events associated with on-orbit testing of MILSTAR Flights 4 and 5, occurring from March-July 2001 and January-March 2002, respectively. More recently, NESP participated in Flight 6 on-orbit testing, taking place from April-June 2003. These tests demonstrated compatibility and interoperability with the LDR and MDR payloads in orbit. Tests included satellite acquisition; simultaneous network operations; interoperable network and point-to-point calls with Army, Navy, and Air Force terminals; and antenna and network control functions.

Anti-jam and a low probability of intercept (LPI) are two important characteristics of the NESP MDR terminal. MDR OT&E is employing modeling and simulation rather than at-sea testing to evaluate the terminal's ability to meet requirements. The Navy conducted model validation testing of both the anti-jam and LPI models in 2001 with additional validation testing in 2002. The models may be accredited pending an on-going review by the Operational Test and Evaluation Force (OPTEVFOR).

The Navy conducted OT&E for the NESP terminal with the MDR appliqué from April 22 to May 10, 2002, in ships and shore stations in San Diego, California, and Pearl Harbor, Hawaii. This test was conducted to support a fielding decision on the MDR appliqué.



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OT&E for the NESP terminal with the NECC was conducted in May, 2003, on ships based in San Diego, California. This test was conducted to support a fielding decision on the NECC.

OT of the FOT was scheduled to begin in October 2002, but was delayed due to poor reliability performance during DT. The Program Manager has issued a software change and is now conducting additional DT. The Program Manager is tentatively planning for a late November OT readiness review. The purpose is to certify both FOT and TIP for OT, OT-IIIF, and OT-IIIE respectively. OPTEVFOR has initiated planning to test both FOT and TIP early in 2004. The submarine MDR terminal operational test schedule will be integrated into the overall MILSTAR and NESP terminal test schedules to the greatest extent possible, consistent with submarine terminal progress.

TEST & EVALUATION ASSESSMENT

At the completion of the LDR IOT&E, DOT&E concluded that the ship and shore NESP terminals were operationally effective, suitable, and supported full fleet introduction. Although the MILSTAR LDR submarine terminal does meet the technical and operational requirements for LPI, operational tests showed that the submarine had a substantially higher probability of signal intercept than DTs had indicated. These LPI results reinforce the role of operational testing in providing the warfighter with the most accurate operational performance information possible.

OPTEVFOR determined that the MDR appliqué is operationally effective and operationally suitable, and recommended fleet introduction. However, no assessments can be made regarding joint interoperability, anti-jamming, and LPI until further testing and modeling and simulation are conducted. The modeling and simulation accreditation is not expected to be complete until mid to late FY04. DOT&E originally recommended additional at-sea testing of MDR LPI performance of the submarine terminal to mitigate risk associated with the model to be used for OT. Additional at-sea testing was completed with inconclusive results. Consequently, DOT&E supports the use of both the anti-jam and LPI models for verifying requirements, but only for a limited range of scenarios where the performance margins predicted by the models are large enough to compensate for the uncertainties in the model results. Predictions of specific vulnerability and standoff distances cannot be relied upon with any certainty.

DOT&E concurred with the September 2003 OPTEVFOR final report stating that the NECC was operationally effective and suitable.